

# Insect Control Product Headstart

We have identified multiple candidate strains with insecticidal efficacy against several agricultural pests in primary discovery screens.

## WORK PERFORMED TO DATE

### Target

Various *lepidoptera spp.* and soil pests (incl. beet armyworm, corn rootworm)

### Mode of action

To be confirmed

### Key assets

- Candidate strains with activity against *Lepidopteran* and soil pests
- High throughput and predictive plant diet and leaf disk assays to nominate strains
- *In planta* potency, spectrum, phytotoxicity assay platform
- Greenhouse / microplot assays for residual activity and predictive performance in field

We've identified strains with insect control activity demonstrated *in planta* when challenged with *Lepidopteran* pests (leaf assay results below).

Strain	Species					
	<i>S. exigua</i>	<i>H. zea</i>	<i>T. ni</i>	<i>A. gemminalis</i>	<i>P. xylostella</i>	BTK-resistant <i>P. xylostella</i>
Baritone (control)						
Strain 1						NT
Strain 2						NT
Strain 3						NT
Strain 4						
Strain 5						
Strain 6						

Red corresponds to better efficacy

## HOW GINKGO CAN PARTNER ON A BIOPESTICIDE PROGRAM

### Wild type formulation and fermentation process development

Select top performing wild type strains and test prototype formulation that matches your desired product strategy in greenhouse and microplots.

### Optimize insect control efficacy of a wild type strain

Combine mutagenesis and ultra high throughput screening to improve efficacy and / or stability of wild type strains with demonstrated insect control activity.

### Express insect control active ingredients in a fermentation-friendly strain

Fully engineer a biochemical production strain to produce high titers of insect control active ingredients.

## HOW WE PARTNER

### Our IP Philosophy

Each party retains ownership of the Background IP they bring to a collaboration. Ginkgo seeks ownership of the foreground IP and grants the partner the licenses needed to manufacture and sell the product in a given market.

### Commercial Structure

Our payment structure reflects our philosophy: we share risk and share in the success. We get paid through a combination of R&D fees and downstream value-share such as royalties, equity or commercial milestones. Through Joint Steering Committees, we work with partners to govern key decisions in project progress.

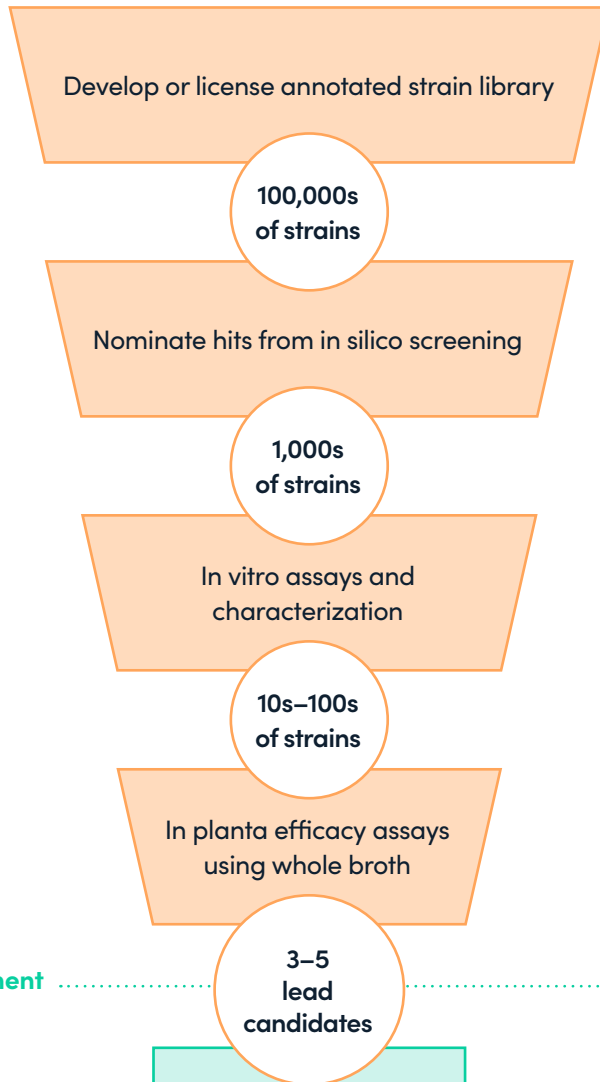
**How to start? Speak to our team!**  
[agriculture@ginkgobioworks.com](mailto:agriculture@ginkgobioworks.com)

# Get a Headstart on Discovery

Access Ginkgo's diverse strain library to accelerate your next biological product

## WILD TYPE MICROBIAL PRODUCT DISCOVERY TO DEVELOPMENT

### Early to late discovery

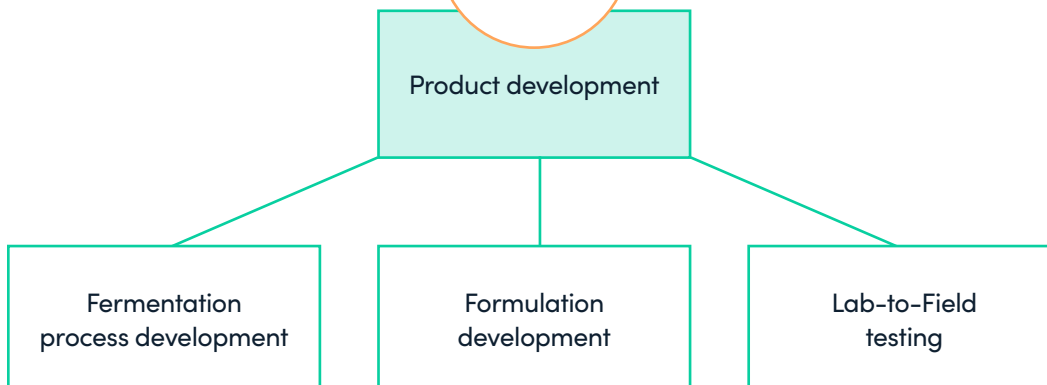


### Shave years off of Discovery with our lead candidate strains

Lead candidate strains emerging from *in silico* screening, *in vitro* testing and *in planta* assays address multiple product applications across crop protection and nutrient use efficiency.

Access our world-class 200,000+ member strain library, sourced from diverse soil and plant-associated environments, to nominate additional candidates for *in vitro* and *in planta* characterization.

### Product development



## PRODUCT DISCOVERY HEADSTARTS

	Application	Lead Candidate Type	Discovery Stage		
			<i>In silico</i> hits	<i>In vitro</i> leads	<i>In planta</i> leads
Crop Protection	Bionematicides	Novel active ingredient	✓	✓	✓
	Biofungicides - Row Crops	Novel strains	✓	✓	✓
	Biofungicides - Specialty Crops	Novel strains	✓	✓	Not tested
	Bioinsecticides	Novel strains	✓	✓	✓
Crop Nutrition	Nitrogen fixation	Novel strains	✓	Not tested	Not tested
	Phosphate solubilization	Novel strains	✓	Not tested	Not tested
	Plant growth regulators	Novel strains	✓	Not tested	Not tested
	Carbon sequestration	Novel strains	✓	Not tested	Not tested

## OUR PLATFORM

### Leverage our end-to-end platform to progress candidates through product development

#### Achieve target COGS with our Fermentation Process Development services

- Optimize process requirements for manufacturing with predictive fermentation tools (e.g., Sartorius Ambr250 ml reactors)
- Test at scale with 3000L pilot plant facility

#### Improve product efficacy and stability with our Formulation Development services

- Industry leading formulation expertise across a range of product concepts - liquid suspensions, dry format formulations, foliar and seed treatment formulations, and adjuvants to enhance bioactives

#### Go to field trials with confidence with our Lab-to-Field Testing services

- 175k ft<sup>2</sup> plant science facility with growth chambers, greenhouses, micro plots and rapid phenotyping (multispectral 3D imaging) capabilities
- Robust platform of efficacy and stability assays to validate biological products in formulation

**Learn more about accessing our lead candidate strains - Schedule a meeting today!**

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